Contribution ID: **222** Contribution code: **PSA-55** Type: **Poster**

Low background In-situ 10Be AMS analysis using improved Be extraction method

Monday, 21 October 2024 16:55 (20 minutes)

Surface exposure dating, which calculates the exposure age of rocks based on the accumulation of in-situ cosmogenic nuclides on the ground surface, is a very useful technique for directly dating the age of exposed rocks. Surface exposure dating has many advantages, but the required high-precision measurement is not easy. This is mainly due to the extremely low abundance of cosmogenic nuclides. The production of in-situ cosmogenic nuclides is proportional to the cosmic ray flux that reaches the ground surface. Cosmic ray penetration to earth’ s surface is shielded by the atmosphere and the earth’s magnetic field. Therefore, the generation rate of cosmogenic nuclides is lower at low altitudes and low-middle latitudes, where the shielding effect of the atmosphere and earth’s magnetic field is high. Therefore, this method is widely applied to high latitude polar regions, such as Antarctica, where the production rate is comparatively higher and to high altitudes in the middle and low latitude regions. However, this method has the advantage of being able to directly measure the age at which rocks were exposed on the ground surface, and is also applied to low-middle latitude areas and low elevation areas near coastlines. Analysis of such samples requires low background beryllium-10 (10Be) measurements.
Ion chromatography using a cation exchange resin has been used for extraction of Be from rock samples for accelerator mass spectrometry. However, with this method, the extraction position of the target Be may be shifted depending on the content of impurity ions contained in the sample, or the impurity ions remain after the ion exchange column experiment and adversely affect the subsequent Be purification. In this study, it was possible to obtain high-purity Be by adding the chelating resin solid phase extraction method using DIPEX (R) extractant to the separation and purification process of Be. By adding this extraction process, the residual amount of boron in the pretreatment process was reduced by more than 90%, and the analysis of ultra-low concentration 10Be became possible. This is expected to make it easier to apply surface exposure dating to low altitude areas in low and middle latitudes such as Japan.

Student Submission

No

Primary authors: MIYAIRI, Yosuke (AORI,Univ.Tokyo); AZE, Takahiro (Atmosphere and Ocean Research Institute, The University of Tokyo); YOKOYAMA, Yusuke (Atmosphere and Ocean Research Institute, The University of Tokyo)

Presenter: MIYAIRI, Yosuke (AORI,Univ.Tokyo)

Session Classification: Poster Session A

Track Classification: Sample Preparation Techniques